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A New Brown Algal Order Ishigeales (Phaeophyceae) on the Basis of Plastid Protein-coding *rbcL* and *psaA* Region Comparisons

Ga Youn Cho^P, Sung Min Boo^C

Department of Biology, Chungnam National University, Daejeon 305-764

The brown algal family Ishigeaceae currently includes a single genus *Ishige*, having two sympatric species that inhabit temperate waters in Korea, China, Japan, and the northeast Pacific of America. The phylogenetic relationship of the family to other brown algal lineages is uncertain. Morphologically, it has been considered as a member of the Chordariales, which is recently treated as the Ectocarpales *sensu lato*, while nuclear ribosomal DNA small subunit region sequences showed the sister relationship to other ectocarpalean algae. We determined sequences of two plastid genes, each encoding for the large subunit of RUBISCO (*rbcL*) and the photosystem I P700 apoprotein A1 (*psaA*), from two *Ishige* species and other representatives covering most of brown algal orders. Analyses of individual and combined datasets strongly support the monophyly of the class Phaeophyceae and the autonomy of most of brown orders. However, the Ishigeaceae was clearly separated from the Ectocarpales, and was instead basal to the remaining phaeophycean taxa. These findings indicate that the family does not share the recent most common ancestor with any members of the Ectocarpales and should be placed in its own order, the Ishigeales ord. nov. The Ishigeales is characterized by having a perennial (prostrate) basal system, marginal (apical) meristematic cells, uniseriate plurilocular sporangia lacking sterile terminal cells, and an isomorphic life cycle. Ultrastructural observations of pyrenoids and other organelles, reflecting phylogeny, using TEM are ongoing.

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단풍나무속(*Acer*)의 신변종, 전주신나무(*A. ginnala* Maxim. var. *jeonjuana* M. Kim)에 대하여
김무열^{PC}, 조한직¹

^{PC} 전북대학교 자연과학대학 생물과학부, 전주 561-756; ¹전북 완주군 고산면 소향리 전원생활, 전주 565-862

새로이 명명된 전주신나무(*Acer ginnala* Maxim. var. *jeonjuana* M. Kim)는 전주에서 가까운 전북 완주군 고산면 소향리에서 조경수와 유실수 연구가인 조한직씨에 의해 처음으로 채집되었다. 전주신나무는 낙엽성 소교목이고 높이는 9-10m이다. 잎은 대생배열하며 엽신은 3개의 장상복엽으로 깊게 쪼갠 후 다시 우상으로 깊게 쪼갠다. 엽병은 1.6-3.8cm이고 엽신의 길이는 6-8cm, 폭은 4.1-6.0cm이다. 잎의 양면은 털이 없다. 꽃은 새로운 가지의 정단에 달리며 20개의 수꽃마다 3-4개의 양성화가 달리며 소화경은 0.5cm이다. 밑반이 수술과 암술의 기부에 있으며 노란색이다. 꽃받침은 5장이며 연두색이고 가장자리에 잔털이 있다. 꽃잎은 5장이며 연두색이고 털이 없다. 수술은 8개이고 화사는 흰색이다. 약은 연두색이며 끝에 돌기가 있다. 암술은 자방상위이고 자방은 2심실에 2개씩 배주가 있으며 흰털이 밀생한다. 주두는 2개로 분지하고 연두색이다. 열매는 시과이며 두개의 날개끝이 서로 벌어져 있으며 날개부위는 붉은색을 띠고 길이는 3cm, 폭은 0.8cm이다. 따라서 전주신나무의 잎은 3개로 깊게 열편된 열편들이 다시 깊게 열편되어 깃털모양을 하고 있고 수술의 꽃밥 끝에 돌기가 있어 모종인 신나무(*Acer ginnala* Maxim.)와 뚜렷이 구별된다. 잎이 깃털처럼 쪼개져 기존 단풍나무와 달리 새로운 분위기를 줄 뿐만 아니라 4월 개화시 꽃향기가 좋고 가을에 아름답게 단풍이 물들어 우수한 조경수이기 때문에 조한직씨에 의해 대량증식하고 있다. 또한 잎형질 안정성도 파종한 종자의 70%가 원래의 형질을 유지하고 있어 우수하다.

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Taxonomic Reappraisal of *Megaleranthis saniculifolia* Ohwi Inferred from nrDNA ITS and cpDNA *matK* Sequence Variation (Ranunculaceae)

Won Kyung Lee^P, Kweon Heo^C

Department of Plant Resources, Kangwon University, Chuncheon 200-701

Megaleranthis saniculifolia Ohwi belongs to Ranunculaceae and endemic genus of Korea. This plant was described as a new genus by Ohwi (1935). *Megaleranthis* is similar to *Trollius* or *Eranthismorphologically*. Therefore, this plant has been controversial the taxonomic treatment in Ranunculaceae. This study was performed phylogenetic analysis of 14 genera in Helleboreoideae using nrDNA internal transcribed spacer and cpDNA *matK* sequences variation in order to conform the taxonomic position as endemic genus. Length of ITS1 region was ranged from 193bp to 252bp and ITS2 is 202bp to 217bp. The length of *matK* is 1512bp to 1545bp. ITS phylogeny suggested that *Megaleranthis* is closely related to genus *Trollius*. Also, the result of *matK* phylogeny is similar to ITS result. Therefore, the taxonomic position of *Megaleranthis* should be treated as a species of *Trollius* rather than monotypic genus. In future, several species of *Trollius* must be included in phylogenetic analysis to resolve this matter.

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Breeding System of *Elsholtzia angustifolia* (Loes.) Kitag. (Lamiaceae)

Hye Kyoung Moon^{CP}, Yun Chang Jeon¹, Suk Pyo Hong¹

Department of Biology, Kyung Hee University, Seoul 130-701

The sexual system of *Elsholtzia angustifolia* (Loes.) Kitag. (Lamiaceae), an annual herb, has never been studied before. The present work is focusing on the careful investigation of *E. angustifolia* flowers collected from one natural population in Korea to clarify their precise sexual system. The results confirm that *E. angustifolia* is clearly a gynodioecious plant in which the population contains female (F) and hermaphroditic (H) individuals. Among the hermaphroditic individuals, a possible intermediate form (HIM) is also revealed, which have usually yellowish anthers producing both fertile and non-viable (i.e., sterile) pollen grains together. In *E. angustifolia*, all investigated floral characters (e.g., corolla, calyx, bract, anther, filament, stigma) are significantly different among the three (F, H, HIM) morphs ($P < 0.0001$), except style length ($P = 0.3989$). The additional observation of some micromorphological characters on the three morphs were also examined to compare the differences among them using SEM. [supported by a grant KRF-2002-015-CP0392]